UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/581,667	06/05/2006	Taichi Majima	0670-7075	4570

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Robinson Intellectual Property Law Office, P.C.
3975 Fair Ridge Drive
Suite 20 North
Fairfax, VA 22033

EXAMINER
YU, LIHONG

ART UNIT	PAPER NUMBER
2611	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/581,667	MAJIMA, TAICHI
	Examiner	Art Unit	
	LIHONG YU	2611	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on _14 September 2011_.
2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.
3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5) ☒ Claim(s) _1-41_ is/are pending in the application.
   5a) Of the above claim(s) _1-34_ is/are withdrawn from consideration.
6) ☐ Claim(s) _____ is/are allowed.
7) ☒ Claim(s) _35-41_ is/are rejected.
8) ☐ Claim(s) _____ is/are objected to.
9) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

10) ☐ The specification is objected to by the Examiner.
11) ☒ The drawing(s) filed on _05 June 2006_ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a) ☒ All   b) ☐ Some * c) ☐ None of:
       1. ☒ Certified copies of the priority documents have been received.
       2. ☐ Certified copies of the priority documents have been received in Application No. _____.
       3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
   Paper No(s)/Mail Date _10/19/2011, 9/14/2011_.
4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1.   A request for continued examination under 37 CFR 1.114, including the fee set forth in

37 CFR 1.17(e), was filed in this application after final rejection. Since this application is

eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e)

has been timely paid, the finality of the previous Office action has been withdrawn pursuant to

37 CFR 1.114. Applicant's submission filed on September 14, 2011 has been entered.

Response to Arguments

2.   Applicants have amended the independent claims. Applicant's arguments with respect to

the claim rejection have been considered but are moot in view of the new ground(s) of rejection.

Double Patenting

3.   The nonstatutory double patenting rejection is based on a judicially created doctrine
grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or
improper timewise extension of the "right to exclude" granted by a patent and to prevent possible
harassment by multiple assignees.   A nonstatutory obviousness-type double patenting rejection
is appropriate where the conflicting claims are not identical, but at least one examined
application claim is not patentably distinct from the reference claim(s) because the examined
application claim is either anticipated by, or would have been obvious over, the reference
claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re
Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225
USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re*

Vogel, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163
USPQ 644 (CCPA 1969).

        A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may
be used to overcome an actual or provisional rejection based on a nonstatutory double patenting
ground provided the conflicting application or patent either is shown to be commonly owned
with this application, or claims an invention made as a result of activities undertaken within the
scope of a joint research agreement.

        Effective January 1, 1994, a registered attorney or agent of record may sign a terminal
disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR
3.73(b).

4.   Claim 35 is provisionally rejected on the ground of nonstatutory obviousness-type double

patenting as being unpatentable over claim 11 of copending Application No. 12/419,559.

        Claim 41 is provisionally rejected on the ground of nonstatutory obviousness-type double

patenting as being unpatentable over claim 13 of copending Application No. 12/419,559.

        A comparison of claims is presented in the table below:

Instant Application 10/581,667	Application 12/419,559
35. A transmission device <u>for 4-value FSK modulation which</u> transmits transmission data including high-importance first data having a predetermined bit number and being protected and second data other than the first data and being unprotected, comprising:	**11.** A reception device which receives a transmission signal which includes high-importance first data having a predetermined bit number and being protected and second data other than the first data and being unprotected, and is transmitted by 4-value FSK modulation, wherein:
a division unit configured to divide the first data into first bit data by a single bit and divide the second data into second bit data by two bits;	the transmission signal is obtained by dividing the first data into first bit data by a single bit, dividing the second data into second bit data by two bits,
a redundant bit addition unit configured to add a redundant bit of a predetermined value to each of the first bit data to generate two bit data; and	adding a redundant bit of a predetermined value to each of the first bit data to generate two bit data, and

a modulation unit configured to perform 4-value FSK modulation for the first bit data to which the redundant bit has been added and the second bit data, with symbol values obtained by a Gray code,	performing the 4-value FSK modulation for the first bit data to which the redundant bit has been added and the second bit data, with symbol values obtained by a Gray code;
wherein the redundant bit is a fixed value bit which is common to, of the four symbols obtained by the Gray code, the two symbols having a largest Euclidean distance, and	the redundant bit is a bit which is common to, of four symbols, the two symbols having a largest Euclidean distance, and
the first data being protected by adding the redundant bit is arranged to either one of the two symbols, among the four symbols, having the largest Euclidean distance capable of improving a signal-to-noise ratio.	the first data being protected by adding the redundant bit is arranged to either one of the two symbols, among the four symbols, having the largest Euclidean distance; and
	the reception device comprises a demodulation unit configured to receive and demodulate the transmission signal, a symbol decision unit configured to perform a symbol decision at each Nyquist interval for the signal demodulated by the demodulation unit, a bit conversion unit configured to convert a symbol value obtained by the symbol decision of the symbol decision unit into a bit value, and a data recovery unit configured to compose a data string by deleting the added redundant bit from the data of the bit value converted by the bit conversion unit, to restore the first data being protected.
41. A transmission method for 4-value FSK modulation, comprising the steps of:	**13.** A reception method which receives a transmission signal which includes high-importance first data having a predetermined bit number and being protected and second data other than the first data and being unprotected, and is transmitted by 4-value FSK modulation, wherein:
dividing high-importance first data having a predetermined bit number and being protected	the transmission signal is obtained by dividing

into first bit data by a single bit;	the first data into first bit data by a single bit,
dividing second data other than the first data and being unprotected into second bit data by two bits;	dividing the second data into second bit data by two bits,
adding a redundant bit of a predetermined value to each of the first bit data to generate two bit data; and	adding a redundant bit of a predetermined value to each of the first bit data to generate two bit data, and
performing 4-value FSK modulation for the first bit data to which the redundant bit has been added and the second bit data, with symbol values obtained by a Gray code,	performing the 4-value FSK modulation for the first bit data to which the redundant bit has been added and the second bit data, with symbol values obtained by a Gray code;
wherein the redundant bit is a bit which is common to, of four symbols, the two symbols having a largest Euclidean distance, and	the redundant bit is a bit which is common to, of four symbols, the two symbols having a largest Euclidean distance, and
the first data being protected by adding the redundant bit is arranged to either one of the two symbols, among the four symbols, having the largest Euclidean distance capable of improving a signal-to-noise ratio.	the first data being protected by adding the redundant bit is arranged to either one of the two symbols, among the four symbols, having the largest Euclidean distance; and
	the reception method comprises the steps of receiving and demodulating the transmission signal, performing a symbol decision at each Nyquist interval for the demodulated signal, converting a symbol value obtained by the symbol decision into a bit value, and composing a data string by deleting the added redundant bit from the data of the converted bit value, to restore the first data being protected.

Although the conflicting claims are not identical, they are not patentably distinct from each other. It is well known in the art that larger Euclidean distance is capable of improving signal-to-noise ratio.

This is a <u>provisional</u> obviousness-type double patenting rejection because the conflicting

claims have not in fact been patented.

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

6.   Claims 35, 36, 40 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over

White et al (US 6,311,306 B1) in view of Beigel et al (US 6,249,212 B1) and Kuznetsov et al

(US 5,881,071).

Consider claims 35 and 41:

White discloses a transmission device for 4-value FSK modulation which transmits

transmission data including high-importance first data having a predetermined bit number and

being protected and second data other than the first data and being unprotected (*see Fig. 3, col. 6,*

lines 59-67 and col. 7, lines 1-5, where White describes a modulation scheme with Gray code 11,

10, 00 and 01 as data symbols, which can be used for 4-value FSK modulation), comprising:

- a division unit configured to divide the first data into first bit data by a single bit and

  divide the second data into second bit data by two bits (*see col. 8, lines 28-53, where*

  White describes the data bits are divided into first subset (A_0, A_1, ...) and second

  subset (B_0, B_1, ...); see col. 7, lines 6-30, where White describes symbols are

transmitted, each symbol word has two bits, A_0 is a most significant single bit and B_0 is a least significant single bit);

- a redundant bit addition unit configured to add a redundant bit of a predetermined value to each of the first bit data to generate two bit data (*see col. 9, lines 20-25, where White describes the most important data bits are provided with redundancy, since each symbol word is two bit, therefore the redundancy is a single bit*); and

- a modulation unit configured to perform 4-value modulation for the first bit data to which the redundant bit has been added and the second bit data (*see col. 6, lines 59-67 and col.7, lines 1-5, where White describes data symbols are 2-bit symbols and the symbols are modulated*), with symbol values obtained by a Gray code (*see col. 6, lines 59-67 and col.7, lines 1-5, where White describes Gray code mapping for the symbol modulation*),

- wherein the redundant bit is a fixed-value bit which is common to, of four symbols obtained by the Gray code, the two symbols having a largest Euclidean distance, and the first data being protected by adding the redundant bit is arranged to either one of the two symbols, among the four symbols, having the largest Euclidean distance capable of improving a signal-to-noise ratio (*see col. 6, lines 53-67, where White describes the Euclidean distance for nearest neighbor symbols of the symbol set (11, 10, 00 and 01) is one; since a single bit redundancy is performed in White's disclosure, only symbols 11 and 00 are symbols that each has a redundant bit, the Euclidean distance is two between symbol 11 and symbol 00*).

However, White does not specifically disclose: (1), the above 4-value modulation is 4-value FSK modulation, and (2), the above largest Euclidean distance is capable of improving a signal-to-noise ratio.

Regarding (1) above, Beigel discloses a 4-value modulation that is 4-value FSK modulation (*see col. 9, lines 20-33*).

It would have been obvious to one skilled in the art at the time the invention was made to modify the invention of White, and to have 4-value FSK modulation, as taught by Beigel, thus allowing for realizing certain communication efficiency, as discussed by Beigel (*see col. 1, lines 60-67 and col. 2, lines 1-3*).

Regarding (2) above, Kuznetsov teaches largest Euclidean distance is capable of improving a signal-to-noise ratio (*see col. 2, lines 36-52, where Kuznetsov describes increasing Euclidean distance to improve signal-to-noise ratio*).

It would have been obvious to one skilled in the art at the time the invention was made to modify the invention of White, and to include largest Euclidean distance is capable of improving a signal-to-noise ratio, as taught by Kuznetsov and well known in the art to improve decoding.

Consider claim 36:

White in view of Beigel and Kuznetsov discloses the invention according to claim 35 above. White discloses each of the first data to be protected comprises flag data (*see White at Fig. 2 and col. 4, lines 41-64, where White describes a subdivider 202 that divides a code vector*

111 into two subsets of code bits 204 and 206, therefore, each data has a flag to indicate its level

of importance).

Consider claim 40:

White in view of Beigel and Kuznetsov discloses the invention according to claim 35

above. White discloses the original data represents a plurality of pieces of information (*see White*

at Fig. 2 and col. 4, lines 41-64, where White describes a code vector 111), and the redundant bit

addition unit operates for respective ones of the plurality of pieces of information (*see White at*

col. 9, lines 20-25, where White describes the more important bits are provided with

redundancy), to add the redundant bit to each of the first data to be protected to generate coded

data (*see col. 9, lines 20-25, where White describes the most important data bits are provided*

with redundancy, since each symbol word is two bit, therefore the redundancy is a single bit).

7.   Claims 37-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over White et al

(US 6,311,306 B1) in view of Beigel et al (US 6,249,212 B1) and Kuznetsov et al (US

5,881,071), as applied to claim 35 above, and further in view of Labonte et al (US 5,828,672).

Consider claim 37:

White in view of Beigel and Kuznetsov discloses the invention according to claim 35

above. However, White does not specifically disclose the first data being protected includes bits

for error check.

Labonte teaches a first data to be protected includes bits for error check (*see Labonte at col. 5, lines 46-60 and col. 6, lines 12-29, where Labonte describes applying 7 CRC bits to the class 1 bits for error check*).

It would have been obvious to one skilled in the art at the time the invention was made to modify the invention of White, and to have that the first data being protected includes bits for error check, as taught by Labonte, thus allowing for an effective error correction, as discussed by Labonte (*see Labonte at col. 5, lines 30-46*).

Consider claim 38:

White in view of Beigel and Kuznetsov discloses the invention according to claim 35 above. However, White does not specifically disclose the first data being protected includes bits for error correction.

Labonte teaches a first data being protected includes bits for error correction (*see Labonte at col. 6, lines 12-29, where Labonte describes that if there is a CRC discrepancy, then the frame is dropped by the CRC decoder, that is, the CRC is used for error correction*). It would have been obvious to one skilled in the art at the time the invention was made to modify the invention of White, and to have that the first data being protected includes bits for error correction, as taught by Labonte, thus allowing for an effective error correction, as discussed by Labonte (*see Labonte at col. 5, lines 30-46*).

Consider claim 39:

White in view of Beigel and Kuznetsov discloses the invention according to claim 35 above. However, White does not specifically disclose the number of the first data being protected is less than the number of the second data being unprotected.

Labonte teaches the number of the first data being protected is less than the number of the second data being unprotected (*see Labonte at col. 5, lines 46-60, where Labonte describes 77 class 1 bits which has error protection, and 82 class 2 bits which has no error protection*).

It would have been obvious to one skilled in the art at the time the invention was made to modify the invention of White, and to have that the number of the first data being protected is less than the number of the second data being unprotected, as taught by Labonte, thus allowing for an effective error correction, as discussed by Labonte (*see Labonte at col. 5, lines 30-46*).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LIHONG YU whose telephone number is (571)270-5147. The examiner can normally be reached on 8:30 am-7:00 pm Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on (571) 272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

like assistance from a USPTO Customer Service Representative or access to the automated

information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lihong Yu/
Examiner, Art Unit 2611